

Outside the Box in Habitat Restoration for Hazardous Remediation

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Permit Conditions

- **Replacement to original grades**
- **80% survival of planted species**
- **Planting spacing**
- **Cook Book**
- **5 yr of monitoring**

Issues

- Increase \$\$\$\$\$
- Can we save \$\$\$\$\$\$
- What are the big dollar items
- T & E impacts

Cook Books

- **Examples of methods**
- **Create problems when implemented**
- **Do not work in all cases**
- **Are not specific to on site conditions**

Vernal Pool Habitats

- Depressions in uplands
- Periodic dry down
- No fish
- Important habitat that is being lost



Issues:

- Removal of contaminated soils in wetland**
- Regrade to original grades**
- 80% survival of planted plants**
- 5 years of monitoring**



Remedial Work Completed

2005



**State & Federally Approved
Diversity of Habitats
vernal pool
wet meadow**

August 2010

Habitat Diversity



June 2006

Habitat Diversity



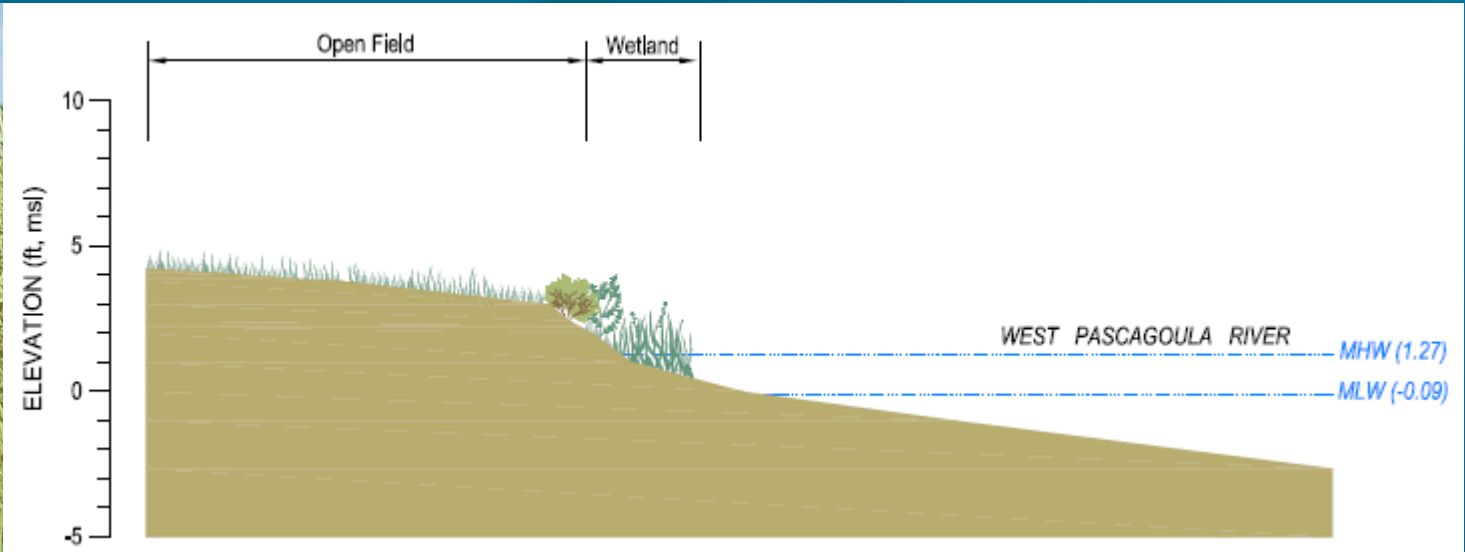
Habitat Diversity

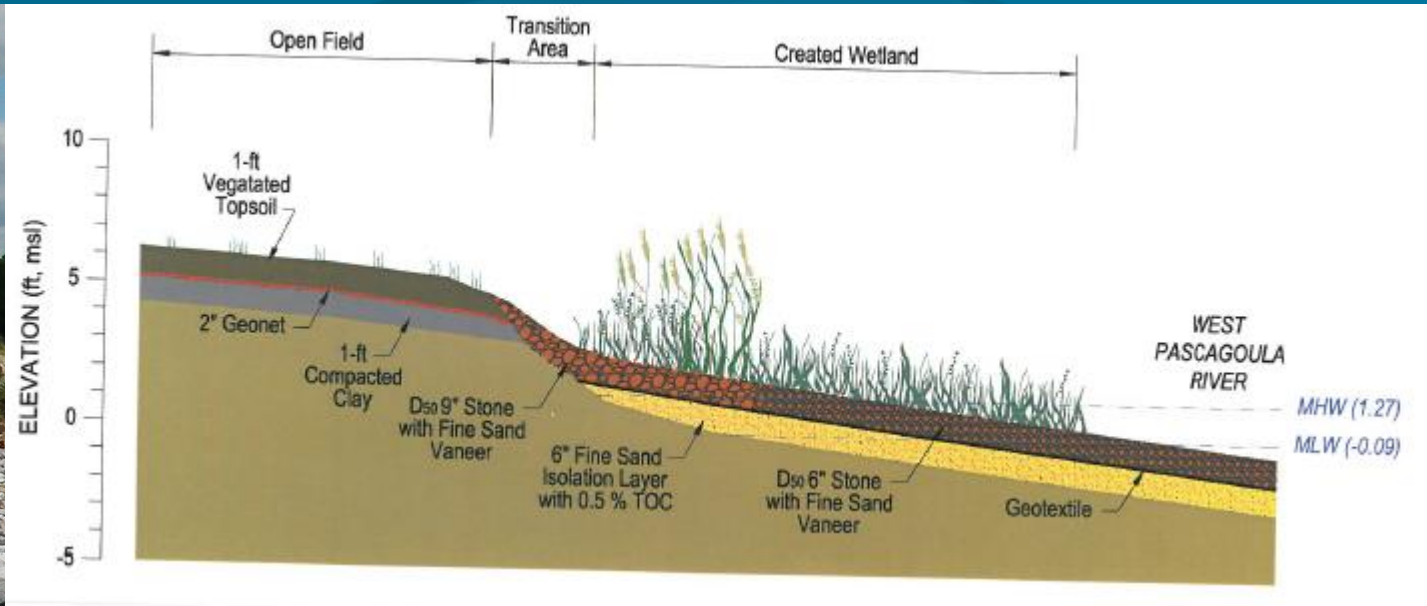
August 2010

Habitat Diversity

State and Federal Approval

October 2012





May 2011



Sand Covered RipRap Cap

August 2011



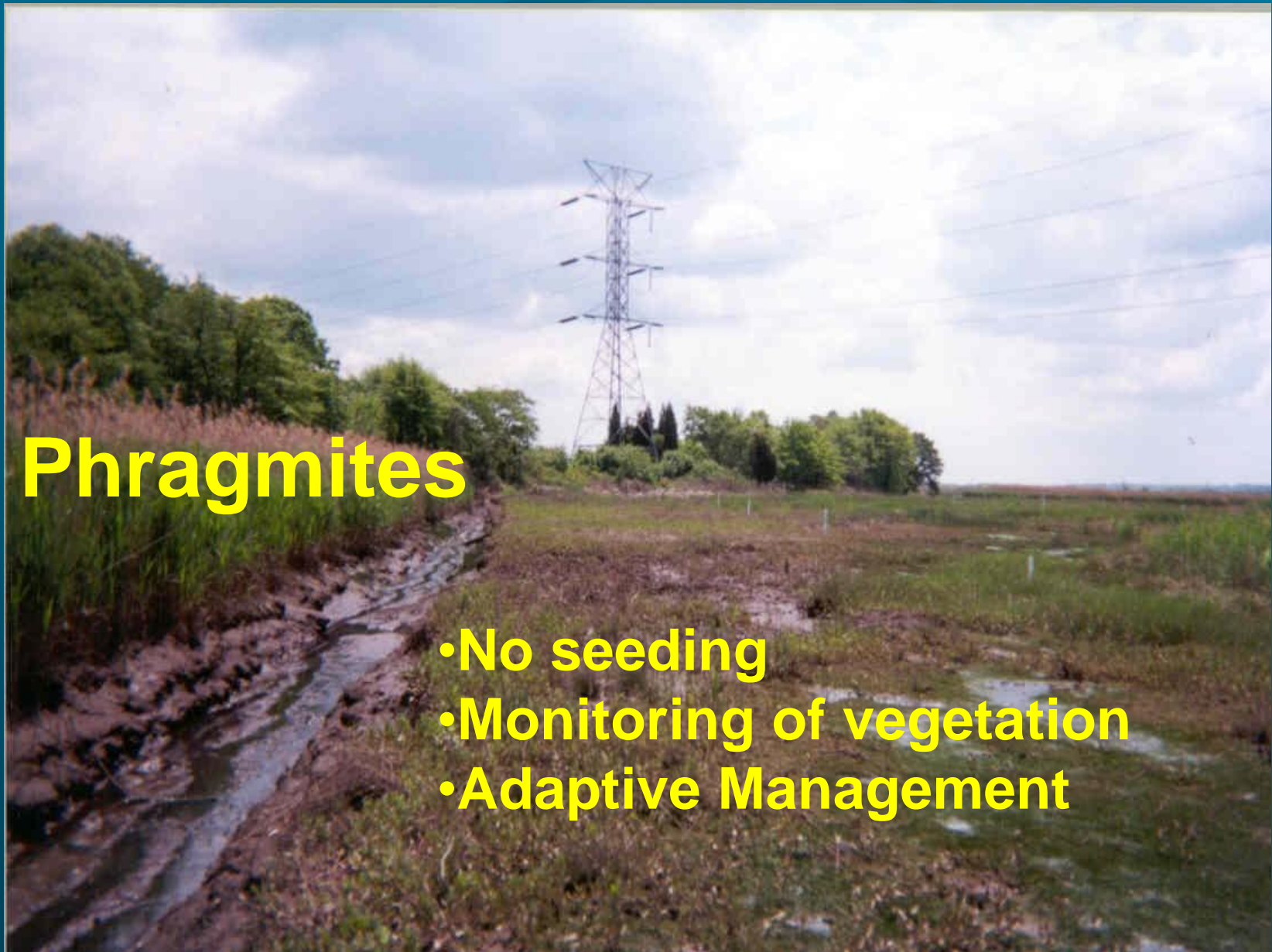
June 2013

Phragmites





Phragmites



Phragmites

- No seeding
- Monitoring of vegetation
- Adaptive Management

Phragmites

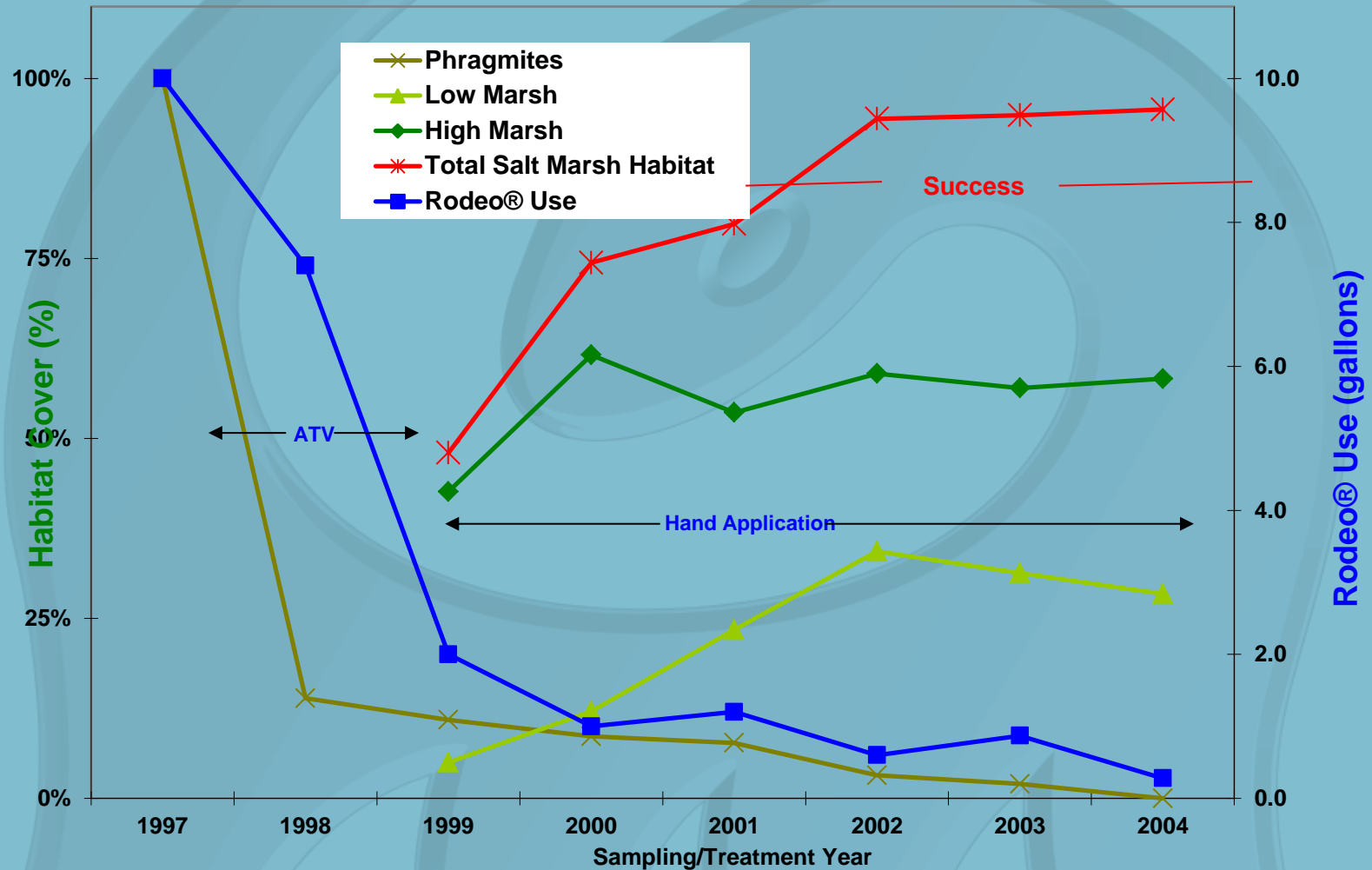




Phragmites

Tidal Salt Marsh

\$10K vs \$250K to \$400K per ac



A dirt road winds through a dense forest. Sunlight filters through the trees, creating a hazy, golden glow. The road is flanked by lush green foliage and trees. The overall atmosphere is serene and natural.

Imagine the result

- **Thinking outside the box**
- **Decrease Project Costs**
- **Increase Habitat Diversity**
- **Adaptive Management**